

Figure 9.10: Bode magnitude plot of a second-order system. The plot shows the magnitude $20 \log |H(j\omega)|$ versus frequency ω . The magnitude is constant at low frequencies, increases linearly with a slope of 40 dB/decade in the mid-frequency range, and levels off at high frequencies. The corner frequency ω_c is indicated by the frequency at which the magnitude begins to level off.

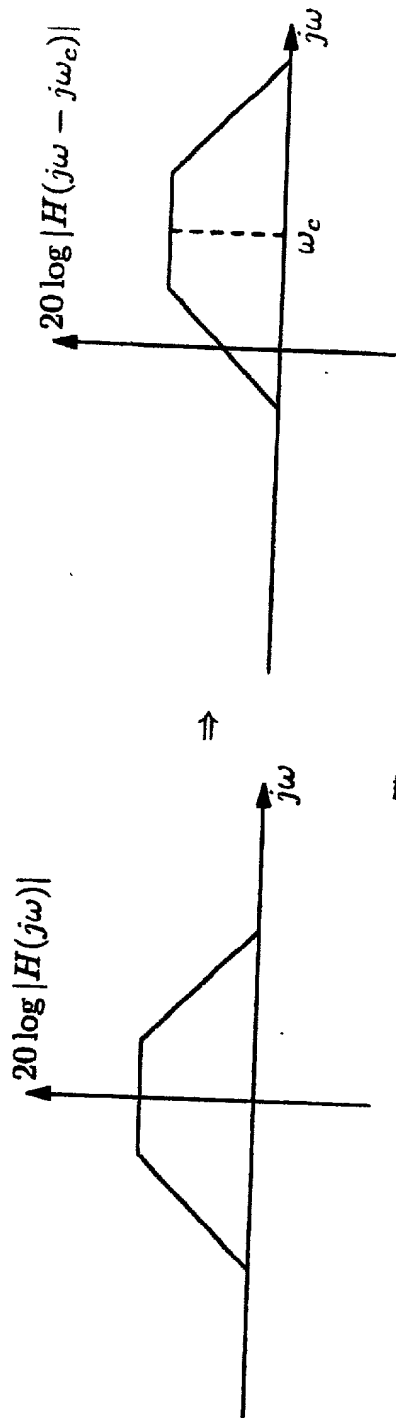


Figure 9.10

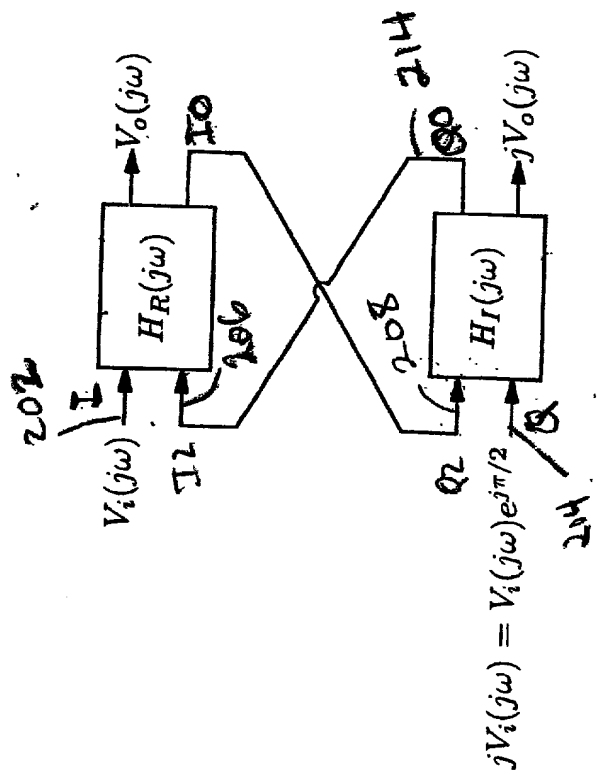


FIGURE 2

300

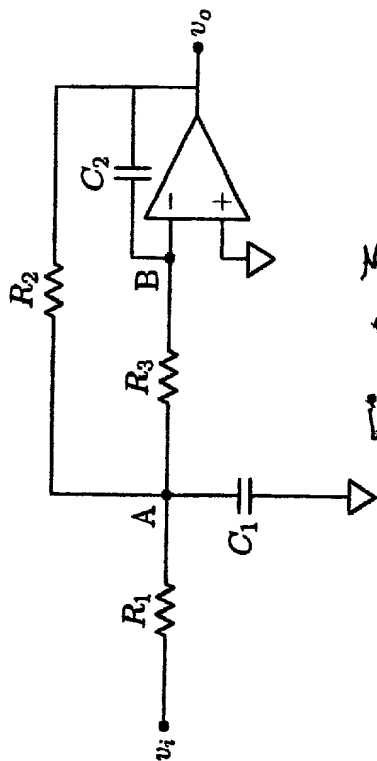


FIGURE 3

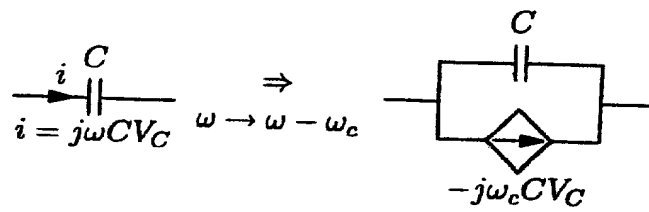


FIGURE 4

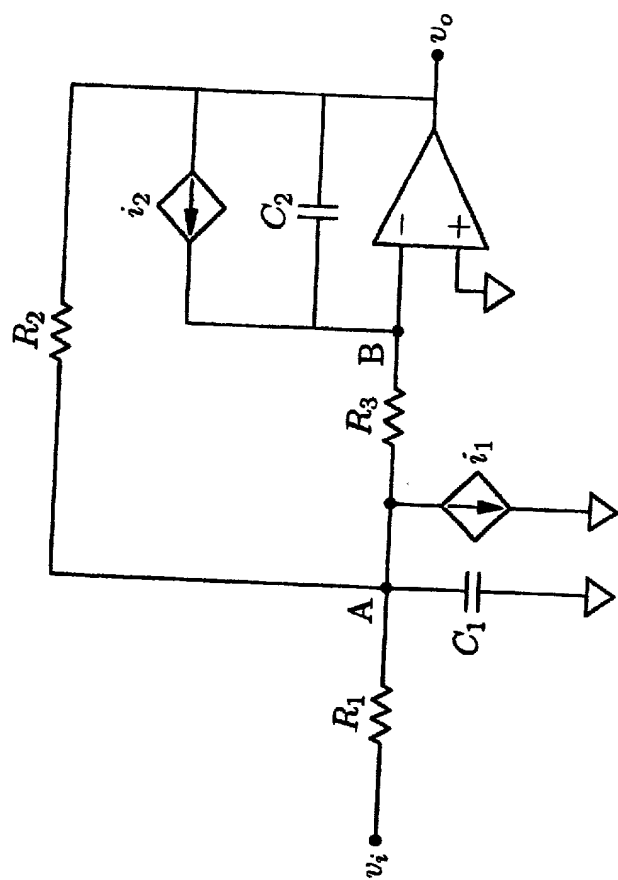


FIGURE 5

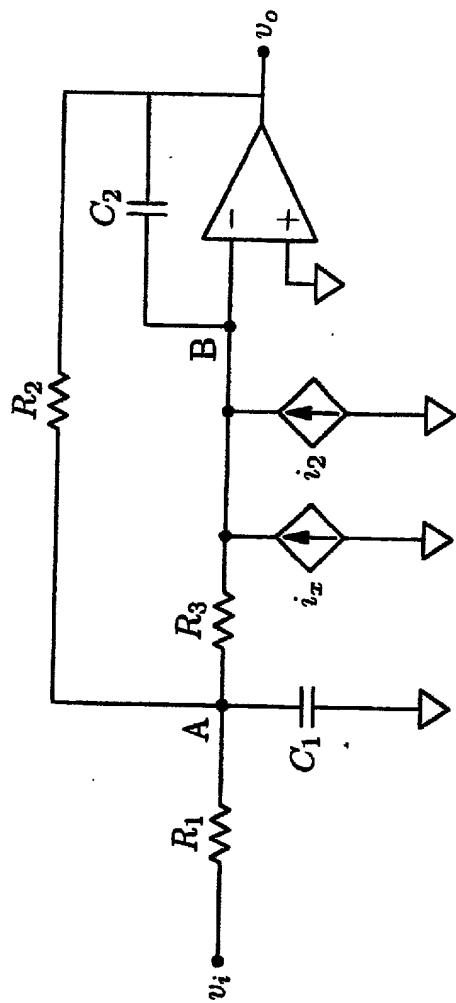


Figure 6:

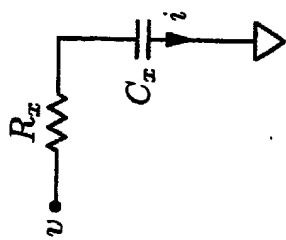


Figure 7:

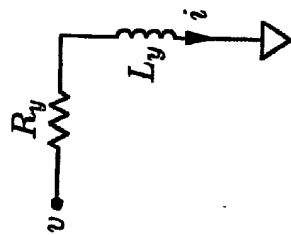


Figure 8:

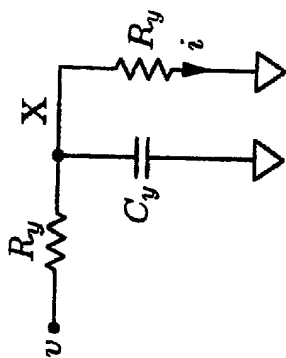
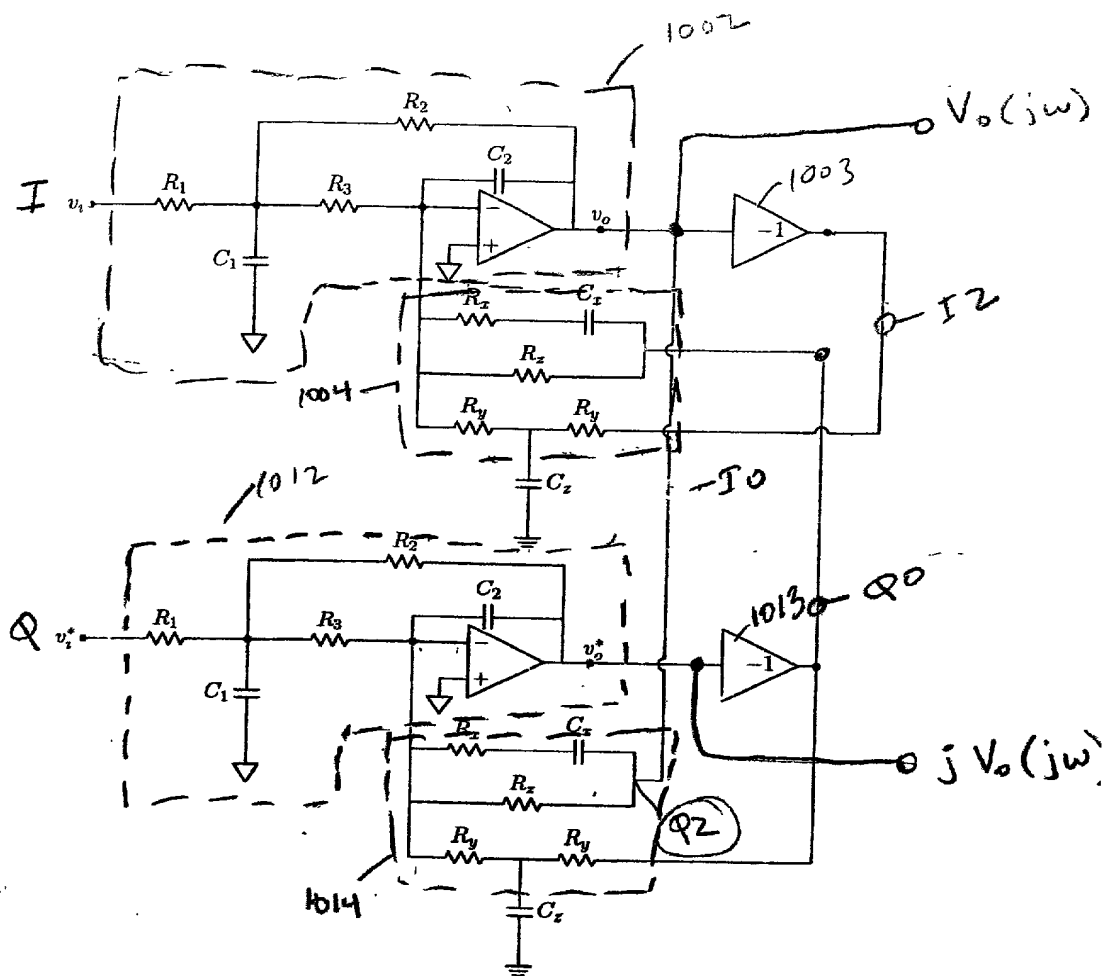


FIGURE 9



$$H_0 = -\frac{R_2}{R_1}$$

$$\omega_0^2 = \frac{1}{C_1 C_2 R_2 R_3}$$

$$\frac{\omega_0}{Q} = \frac{1}{C_1} \left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \right)$$

$$R_y = \frac{1}{2\omega_c^2 C_2} \frac{\omega_0}{Q}$$

$$C_y = \frac{2}{R_y} \frac{1}{\frac{\omega_0}{Q}}$$

$$= 4\omega_c^2 C_2 \left(\frac{\omega_0}{Q} \right)^2$$

$$R_x = \frac{1}{\omega_c C_2}$$

$$C_z = \frac{1}{R_x \frac{\omega_0}{Q}}$$

$$= \frac{\omega_c C_2}{\frac{\omega_0}{Q}}$$

$$R_z = 1/\omega_c C_2$$

Figure 10: